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ABSTRACT

This program guide identifies primary concerns in the organization, operation, and evaluation of a building maintenance program. It is designed for local school district and community college administrators, instructors, program advisory committees, and regional coordinating councils. The guide begins with the Dictionary of Occupational Titles occupational description. A section on program content presents the curriculum framework that contains major concepts/content, laboratory activities, special note, and intended outcomes and the student performance standards that are divided into the outcomes shown in the curriculum framework. The section on program implementation addresses the following: teacher characteristics, conventional instructional methods, student admissions criteria, student placement, cooperative education, and student organization participation. An instructional resources section lists suggested resources organized by outcome. The section on setting up classroom and laboratory facilities covers facility design recommendations and safety, maintenance, and liability. The next section lists equipment items by outcome. The last section discusses teacher technical updating and teacher standards. A list of professional organizations and support services follows. A Career Merit Achievement Plan (Career MAP) is attached. It displays the competencies required for entry into the field of building maintenance and documents the student's level of achievement. (NLA)

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FLORIDA VOCATIONAL PROGRAM GUIDE FOR BUILDING MAINTENANCE

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INTRODUCTION

Vocational education meets the needs of students desiring to pursue a selected vocation and is designed to provide training that is realistic in meeting present and future employment opportunities. In recent years, applications of science and technology have expanded rapidly, increasing the education and training required of workers. This has made vocational training programs more attractive as an educational option. The new technologies require well-trained workers to carry out both standardized and specialized procedures, and whose training foundation has given them the capacity to keep pace with continuing technology demands.

The Florida Department of Education shares with business and industry the determination to provide opportunities for upward mobility to as many Floridians as possible. Vocational training programs can keep pace with the demands of new industrial patterns and can provide the opportunity for many of our citizens to gain financial stability and an improved sense of self worth. Therefore, it is necessary to create exemplary vocational programs and to make those programs consistent throughout the state.

This Program Guide identifies primary concerns that should be considered in the organization, operation and evaluation of a vocational education program. It has been developed to provide useful information to local school district and community college administrators, instructors, program advisory committees, regional coordinating councils and others charged with the responsibility of offering vocational education programs.

OCCUPATIONAL DESCRIPTION

A principle occupational title is identified for each vocational training program. This title is validated by the United States Department of Labor Dictionary of Occupational Titles (DOT) or other appropriate references. Such references may be the United States Department of Commerce Standard Occupational Classification Manual (SOC), the Occupational Employment Statistics Survey Dictionary (OES), or Vocational Preparation and Occupations (VPO) prepared by the National and State Occupational Information Coordinating Committees. Information obtained from industry advisory committees may also be used to validate the principle occupational title. The job title and code number for this program are listed in the curriculum framework which accompanies this guide.

The United States Department of Labor Dictionary of Occupational Titles (D.O.T.) identifies the job title for this occupational area as follows:

D.O.T. JOB TITLE	D.O.T. CODE
General Maintenance Repairer	899.381-010

(Occupational Employment Statistics equivalent code 50144821)

The definition (description) for this job title is taken from the D.O.T. for easy reference.

899.381-010 GENERAL MAINTENANCE REPAIRER.

Repairs and maintains physical structures of commercial and industrial establishments, such as factories, office buildings, apartment houses and logging and mining constructions, using handtools and power tools: Replaces defective electrical switches and other fixtures. Paints structures and repairs woodwork with carpenters' tools. Repairs plumbing fixtures. Repairs plaster and lays brick. Builds sheds and other outbuildings.

PROGRAM CONTENT

The Division of Vocational, Adult, and Community Education, as required by State Board of Education (S.B.E.) **Rule 6A-6.0571**, publishes Vocational Education Program Courses Standards annually. This document specifies the minimum program content for the operation of a vocational training program for the occupational titles listed. Each program identified in the Florida Department of Education Course Code Directory is required to establish course standards. The standards for each vocational offering are comprised of two major components: (1) Curriculum Framework and (2) Student Performance Standards.

Curriculum Framework (CF)

The Curriculum Framework specifies the exact course title, course number, levels of instruction, major course content, laboratory activities, special notes, major course concepts and intended outcomes. The program requirements stipulated in the curriculum framework have been approved by the State Board of Education and are the legal bases for delivery of instruction.

Student Performance Standards (SPS)

The Student Performance Standards are a resource list of job-specific competencies. This list is generated and approved by industry experts and becomes the basis for curriculum development in vocational programs. Local school districts and community colleges must, by law, adopt student performance standards for their vocational programs. They may, at their discretion, adopt the list provided or develop their own as long as there is sufficient content to address each intended outcome. A program may provide instruction beyond the minimum specified in the SPS if desired. The decision to do this should be based on local industry needs. However, the minimum must be presented.

The SPS for secondary level programs contain a third component, course structure. This component specifies the number of courses required for program completion and the content of each course. The courses may be taught in any sequence, but the content may not be changed unless approved by the Division of Vocational, Adult, and Community Education.

The curriculum framework and student performance standards are intended for use as a guide, not a teaching tool. Teachers or curriculum development personnel are expected to develop or select complete curriculum materials for their training programs based on the curriculum framework and student performance standards. Each intended outcome and SPS should be thoroughly analyzed for related cognitive and procedural subskills. The curriculum framework and student performance standards are presented in the following pages.

CURRICULUM FRAMEWORK PROGRAM AREA: Industrial

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1989

PROGRAM TITLE: Building Maintenance

CODE NUMBER: Secondary 8721300 Postsecondary _____

Florida CIP IN46.040100

SECONDARY SCHOOL CREDITS 6 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVELS(S): __ 7-9 __ 9-12 __ Postsecondary Adult Vocational

__ Postsecondary Vocational __X__ Other 10-12, 21

CERTIFICATION COVERAGE: BLDG MAINT 7 BLDG CONST @ 7

I. MAJOR CONCEPTS/CONTENT--The purpose of this program is to prepare students for employment as general maintenance repairers (501 44821). This program also provides supplemental training for persons previously or currently employed in this occupation.

The course content will include the following: use of blueprints and schematics, basic carpentry repairs and maintenance; basic electrical system fault diagnosis and repair; basic plumbing system repairs and maintenance; basic masonry repairs and maintenance; maintenance of air conditioning and heating systems; application of finishes; cleaning of building surfaces; recordkeeping; use and care of hand tools; use of power tools and equipment; and use of current industry standards, practices and techniques.

The course content should also include Principles of Work Environment Readiness (P.O.W.E.R.) skills training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Listed below are the courses that comprise this program when offered at the secondary level:

8721310 Building Maintenance 1
8721320 Building Maintenance 2
8721330 Building Maintenance 3
8721340 Building Maintenance 4
8721350 Building Maintenance 5
8721360 Building Maintenance 6

II. LABORATORY ACTIVITIES: Shop or laboratory activities are an integral part of this program. These activities provide instruction in the use of tools, equipment, materials and processes found in the industry. Students are also instructed in the following: carpentry, plumbing, masonry, air conditioning, application of finishes and cleaning structural surfaces.

III. SPECIAL NOTE: The Vocational Industrial Clubs of America, Inc., is the vocational student organization which reinforces classroom instruction by providing communications, leadership, human relations and employability training experiences. It also reinforces specific vocational skills. When provided, these activities are considered an integral part of this program.

The cooperative method of instruction may be utilized for this program. When the cooperative method is offered, the following is required for each student: a training plan signed by the student, teacher and employer which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a work station which reflects equipment, skills and tasks relevant to the occupation the student has chosen as a career goal. The student must receive compensation for work performed.

The outcomes and student performance standards which the handicapped student must master must be specified in each student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with subsequent IEP's. The job title for which the student is being trained must be designated in the IEP.

IV. INTENDED OUTCOMES: After successfully completing this program the student will be able to:

01. Demonstrate basic maintenance fundamentals.
02. Demonstrate ability to read plans and drawings.
03. Demonstrate proficiency using basic hand tools.
04. Demonstrate proficiency using power tools.
05. Repair interior floors, walls and ceilings.
06. Perform repairs on doors, windows and screens.
07. Repair and replace cabinets.
08. Apply finishes to properly prepared surfaces.
09. Identify wood construction components.
10. Repair roofs.
11. Repair exterior masonry surfaces.
12. Perform plumbing system repairs and maintenance.
13. Perform electrical system fault diagnosis and repair.
14. Demonstrate and practice employability skills.
15. Demonstrate an understanding of entrepreneurship.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1989

PROGRAM AREA: Industrial Education SECONDARY NUMBER: 8721300

PROGRAM TITLE: Building Maintenance PROGRAM NUMBER: ____ __

01.0 DEMONSTRATE BASIC MAINTENANCE FUNDAMENTALS--The student will be able to:

- 01.01 Comply with safety rules and practices.
- 01.02 Make job-related decimal and fraction calculations.
- 01.03 Solve job-related problems by adding, subtracting, multiplying and dividing numbers.
- 01.04 Change numbers to percents.
- 01.05 Solve job-related problems operating a hand-held calculator.
- 01.06 Use ruler and tape measure to determine measurements.
- 01.07 Compute feet, inches and yards.
- 01.08 Change hours and minutes to decimals, fractions and mixed numbers.
- 01.09 Find inside and outside diameters of a pipe.
- 01.10 Calculate the time charged for labor of a job.

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS--The student will be able to:

- 02.01 Identify dimensions.
- 02.02 Identify construction views, floor plans and elevations.
- 02.03 Identify interior details.
- 02.04 Identify wiring details.
- 02.05 Identify use of the architect's scale.
- 02.06 Identify electrical wiring symbols.
- 02.07 Identify lists of materials and specifications.
- 02.08 Identify section views.
- 02.09 Identify plumbing symbols used in blueprints.
- 02.10 Identify fitting symbols used in blueprints.

03.0 DEMONSTRATE PROFICIENCY USING BASIC HAND TOOLS--The student will be able to:

- 03.01 Use claw hammer to drive and pull out nails.
- 03.02 Use hand saws to cut boards.
- 03.03 Use screwdrivers to drive in screws.
- 03.04 Drill holes with hand powered drills.
- 03.05 Identify types and describe use of wrenches.
- 03.06 Identify types and describe use of pipe wrenches and plumbing tools.
- 03.07 Identify types and describe proper use of chisels.
- 03.08 Identify types and describe proper use of a staple gun.
- 03.09 Identify types and describe proper use of a wood plane.
- 03.10 Identify types and describe proper use of woodworking files.
- 03.11 Identify types and describe proper use of the spirit level.
- 03.12 Identify types and describe proper use of a socket wrench set.
- 03.13 Identify types and describe proper use of a hand or block sander.

03.14 Identify types and describe uses of carpenters' squares and levels.

04.0 DEMONSTRATE PROFICIENCY USING POWER TOOLS--The student will be able to:

04.01 Setup, use and maintain portable power orbital sander, belt sander and finish sander.
04.02 Setup, use and maintain portable drill and power screwdriver.
04.03 Setup, use and maintain hand held circular saw and reciprocating saw.
04.04 Setup, use and maintain a radial arm saw.
04.05 Setup, use and maintain a table saw.
04.06 Setup, use and maintain a drill press.
04.07 Setup, use and maintain a band saw.
04.08 Setup, use and maintain a power plane.

05.0 REPAIR INTERIOR FLOORS, WALLS AND CEILINGS--The student will be able to:

05.01 Repair a hole in dry wall.
05.02 Install paneling.
05.03 Install dry wall.
05.04 Check and repair fabric wall covering.
05.05 Replace broken floor tile.
05.06 Install interior trim.
05.07 Measure size of room.
05.08 Replace ceramic tile.
05.09 Describe the processes to shampoo carpets.

06.0 PERFORM REPAIRS ON DOORS, WINDOWS AND SCREENS--The student will be able to:

06.01 Install a prehung door and casing.
06.02 Install door hardware.
06.03 Replace doors.
06.04 Check and replace hinges on doors.
06.05 Check and replace door closers.
06.06 Remove, measure and replace glass in wood frame window.
06.07 Remove, measure and replace glass in metal frame window.
06.08 Replace screen on wood screen frame.
06.09 Replace screen on metal screen frame.
06.10 Check and repair window glaze seal.
06.11 Replace sash locks in wooden windows.
06.12 Inspect and replace metal window operators and locks.

07.0 REPAIR AND REPLACE CABINETS--The student will be able to:

07.01 Identify parts of a cabinet.
07.02 Identify types of cabinet door installation.
07.03 Identify types of cabinet hardware.
07.04 Install cabinet hardware.
07.05 Describe cabinet installation procedures.

08.0 APPLY FINISHES TO PROPERLY PREPARED SURFACES--The student will be able to:

- 08.01 Erect an extension ladder for working at a height of twelve feet.
- 08.02 Erect a scaffold to work at a height of twelve feet.
- 08.03 Paint a surface with a roller, brush and sprayer.
- 08.04 Prepare, seal and stain new wood.
- 08.05 Apply coat of clear finish to stained wood.

09.0 IDENTIFY WOOD CONSTRUCTION COMPONENTS--The student will be able to:

- 09.01 Identify components of interior walls.
- 09.02 Identify components of exterior walls.
- 09.03 Identify components of roofs.
- 09.04 Identify components of flooring systems.

10.0 REPAIR ROOFS--The student will be able to:

- 10.01 Check and repair asphalt shingles.
- 10.02 Check and repair roof gutters and downspouts.
- 10.03 Seal pipes and vents on roofs.
- 10.04 Check and repair sheetmetal roofs.

11.0 REPAIR EXTERIOR MASONRY SURFACES--The student will be able to:

- 11.01 Identify the tools and equipment used for mixing mortar.
- 11.02 List the factors affecting consistency of mortar.
- 11.03 List common ratios of mortar mixtures.
- 11.04 Mix tuck pointing mortar.
- 11.05 Apply mortar for brickwork.
- 11.06 Identify methods of putting up the line.
- 11.07 Identify types of trowels.
- 11.08 Apply mortar for block work.
- 11.09 List reasons for cleaning.
- 11.10 Identify cleaning equipment.
- 11.11 List types of cleaning material.
- 11.12 List reasons for caulking.
- 11.13 Match types of caulking to specific uses.
- 11.14 Replace caulking in expansion joints.
- 11.15 List safety precautions to follow when cleaning.
- 11.16 Identify methods of wall cleaning.

12.0 PERFORM PLUMBING SYSTEM REPAIRS AND MAINTENANCE--The student will be able to:

- 12.01 Replace fixtures and hardware.
- 12.02 Replace a lavatory.
- 12.03 Describe procedures to replace bathtubs and showers.
- 12.04 Replace kitchen sinks.
- 12.05 Install garbage disposals.
- 12.06 Repair or replace water closet components.

12.07 Replace traps.
12.08 Repair leaks in faucets.
12.09 Replace hot water heater tanks.
12.10 Replace or repair fixture water supply pipes.
12.11 Reseal toilets to flanges.
12.12 Test and inspect repaired systems.
12.13 Cut metal pipe with a one wheel steel pipe cutter.
12.14 Join plastic pipe to steel pipe.
12.15 Thread steel pipe with a nonadjustable die stock.
12.16 Cut copper tubing or pipe with a hacksaw.
12.17 Cut copper tubing or pipe with a tubing cutter.
12.18 Bend copper tubing or pipe with a spring bender.
12.19 Join copper tubing or pipe to copper tubing or pipe.
12.20 Join copper tubing to brass pipe fittings.
12.21 Join copper tubing to steel pipe.
12.22 Join copper tubing or pipe to plastic pipe.
12.23 Clean a drain and vent system with a manual snake or tape.

13.0 PERFORM ELECTRICAL SYSTEM FAULT DIAGNOSIS AND REPAIR--The student will be able to:

13.01 Replace duplex wall outlet.
13.02 Replace single pole light switch.
13.03 Replace a light in a fluorescent system.
13.04 Replace a faulty breaker.
13.05 Use a meter to determine continuity in an electrical distributor system.
13.06 Deenergize a circuit for repairs.
13.07 Trace electrical circuits.
13.08 Replace a ballast in a fluorescent system.
13.09 Check a heating-cooling thermostat.
13.10 Use a voltage tester.
13.11 Read resistance with an ohmmeter.
13.12 Service air filters.
13.13 Identify types of conduit.
13.14 Describe functions of a basic refrigeration system.
13.15 Replace a thermostat for a split system.

14.0 DEMONSTRATE AND PRACTICE EMPLOYABILITY SKILLS--The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 Identify documents that may be required when applying for a job.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons.
14.07 Identify acceptable work habits.
14.08 Demonstrate knowledge of how to make job changes appropriately.
14.09 Demonstrate acceptable employee health habits.

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

15.01 Define entrepreneurship.
15.02 Describe the importance of entrepreneurship to the American economy.
15.03 List the advantages and disadvantages of business ownership.
15.04 Identify the risks involved in ownership of a business.
15.05 Identify the necessary personal characteristics of a successful entrepreneur.
15.06 Identify the business skills needed to operate a small business efficiently and effectively.

PROGRAM IMPLEMENTATION

It is the teacher's responsibility to ensure that students learn how to competently perform the tasks specified in the course objectives. Therefore, the teacher must lead the students through the learning experiences in a course, motivate students, act as a role model for students, and at times, function as a guidance counselor and placement coordinator. This leadership role requires the teacher to participate in many of the activities required for program implementation. The teacher must select the methods of instruction that best apply to students' ability levels, measure student achievement and provide feedback. Key factors that must be considered when implementing this program are addressed below.

TEACHER CHARACTERISTICS

Subject Knowledge

The teacher must be a subject matter expert who is able to implement sound instructional methods and evaluate student performance. He/she must have significant work experience in the industry/vocational field and be able to communicate that knowledge to the students.

Instructional Delivery

The teacher's role in the learning process is to motivate and lead the student as well as impart subject matter knowledge. In order to maximize student learning, the use of a variety of instructional methods is encouraged. Because teaching styles vary greatly, teachers are highly encouraged to "pick and choose" from various methods or to combine methods for maximum benefit to students. Some of the more traditional methods used are lecture, demonstration and small group instruction. Other teaching methods which are suggested for further exploration include individualized self-paced, open-exit/open-entry, contract, computer based and competency based instruction. The focus of Competency Based Vocational Education (CBVE) is to ensure that each student can competently perform tasks specified before progressing to more complex skills.

CONVENTIONAL INSTRUCTIONAL METHODS

A vocational program may require a portion of the instruction to be presented in a standard lecture or controlled demonstration format. These methods of instruction can be easily combined with instructor controlled step-by-step practical exercises. Some instructional activities may dictate that this instructional approach be used to introduce students to hazardous equipment often utilized in vocational training. In most situations, students should be required to perform specified activities to achieve maximum skill competency. If mastery of a task is required, competency based education methods may be more appropriate. However, if the training activity involves an orientation or a seldom performed, non-essential task, conventional instructional methods may be more effective. Teachers are encouraged to use a variety of instructional methods to best meet instructional objectives.

Instructional Development

Teachers often must develop and select their own teaching and curriculum materials. In developing a comprehensive curriculum, instructional objectives based upon both the performance and cognitive domain must be included. When developing curriculum materials, teachers must use the curriculum framework (CF) and student performance standards (SPS) contained in this program guide as a basis. These materials delineate minimim program content which must be presented for an approved vocational training program. However, they are not intended for use as a comprehensive curriculum. Be certain not to adapt the curriculum to available materials, but select only those materials which can be adapted to the curriculum.

Instructional Measurement

Teachers must select testing methods that support the instructional delivery system used. Teachers must be competent to develop, administer and evaluate written and performance type tests.

Student Admissions Criteria

Providing the student the opportunity to successfully complete a vocational education program, in any institution, should be the primary concern of the instructional effort. Therefore, it is very important to direct planning and effort into identifying and selecting students with excellent potential for success in the educational program and in the occupation. The school's primary task is to prepare people for fulltime, entry-level positions as technicians or, in the case of those with more experience, as managers.

The Course Code Directory, specifies grade levels at which occupational programs are offered. Specific student admissions criteria which is required by the State and local educational agencies for the Building Maintenance training program is illustrated as follows.

SPECIFIC ADMISSIONS CRITERIA

Minimum Age:	As required by state and local policy
Physical Requirements:	None
Special Requirements:	None
Minimum Basic Skills Math Level:	* NA
Minimum Basic Skills Language Level:	* NA

* This grade level requirement is specified in the Curriculum Framework and is applicable to postsecondary level programs of 450 hours or more only. There is no minimum basic skill requirement for secondary programs.

THE STUDENT PROFILE

Developing a student profile is an important step in program implementation. Attention should focus on student characteristics that can be remediated within a training program, but could create serious impediments to success in the vocational field. Typical of these would be deficiencies in communications and mathematical skills. The basic skill levels can be measured by testing. Test results can then be used to direct the student to more suitable training which matches his or her skill level, or to determine supplemental training which may be required to increase chances for student success.

High school and postsecondary vocational students can be admitted to a vocational program upon request if they meet any specified prerequisites, such as physical or basic skill requirements. Training programs should be accessible to as many students as possible. Training programs are designed to prepare students for employment upon graduation, or serve as prerequisite to a postsecondary program.

The community college can be more selective and establish stringent admission standards. This may be done by assessing applicants or by recruiting potential students who meet the established prerequisite requirements of the training. The program advisory committee can design a profile of the potentially successful student. The profile should contain a

list of qualities, traits and aptitudes that will indicate a higher potential for student success. Acceptable levels for these traits must also be determined. For example, the qualities deserving highest attention, mechanical ability and cognitive aptitude, are those which the educational program itself will not likely be able to influence, although these traits should have considerable weight in establishing the basic profile. Deficiencies in mathematical or communications skills may lend themselves to improvement through related instruction while the student is enrolled in the program. The following example illustrates specific qualities to consider when establishing the student profile:

Mechanic/Technician--Service

- Knowledge of basic tools and equipment used by mechanics/technicians
- Ability to analyze and solve mechanical and technical problems
- Ability to interpret written mechanical/technical materials
- Ability to interpret mechanical/technical drawings
- Mechanical dexterity

Mechanic/Technical Service Management

- Basic application of service
- Business skills
- Ability to work with people
- Communications skills
- Leadership

QUALIFYING AND PRETESTING

Assessing potential students for vocational programs is an integral part of the recruiting process since considerable amounts of time and money will be spent on students entering training. Recruiters must have a good idea of the candidate's basic aptitude. Whoever guides the candidate to the program needs to have knowledge of the student's interests, abilities and experience. These can be measured by a variety of assessment methods, which should be performed upon program entry. The assessment can help determine extent and level of training each individual should receive.

Assessment should determine the level at which the student can read, write, calculate mathmatics and understand the English language. It is appropriate for the program advisory committee and the school to develop some selection criteria based on minimum skill levels. These criteria should remain flexible in order to maximize educational opportunity for all applicants. Additionally, vocational educators must make every effort to serve the variety of "special needs" students and to eliminate sex-bias and stereotyping in all occupational areas.

ADVISORY COMMITTEE

It is imperative that representatives of industry be organized into an advisory committee. Constantly changing technological demands of our society will continue to stimulate changing industrial patterns. Therefore, effective use of program advisory committees is vital to the successful implementation of vocational training programs. Advisory committees provide expert technical advice which is not easily obtainable elsewhere, offer external support of policies and have tremendous public relations potential.

The most effective advisory committees are those whose members have mutual respect for each other's abilities and vested interest in the training program because of their need for trained workers. The program advisory committee is also one of the most effective means of facilitating placement. Its role can be:

- To contact local industry and encourage them to use the school's placement office as a means of filling jobs
- To develop an effective procedure for interviewing and evaluating potential employees suggested by the school
- To assist in gathering accurate and current job information as it becomes available

COUNSELING AND GUIDANCE

Counseling of students serves two purposes. It guides the student into the program and it supports enrolled students on a continuing basis throughout the program. Much day-to-day counseling will be the responsibility of the teacher. The teacher has the most contact with the student and is in a position to detect and correct a problem. Each student will encounter new problems as the program develops. The teacher's job is to work with the student to help identify problems and then strive for solutions. The teacher will provide much of the counseling that focuses on trade knowledge and skills.

The professional counselor cannot be expected to have the subject matter expertise of the primary teacher. The counselor, however, can focus on the student's needs related to other issues such as personal growth, interests and attitudes. The ideal situation will provide at least one counselor with current knowledge of industry standards for career counseling. A useful tool which should be used in the counseling process is the Career Merit Achievement Plan (Career MAP) which presents minimum instructional content keyed to student performance standards. Career MAPs are available for each industrial program area, and can be used to document student achievement, isolate student interests, talents and weaknesses. They are also useful for placement purposes. Information on Career MAPs may be obtained by contacting the Department of Education, Division of Vocational, Adult, and Community Education, (904) 488-0484.

STUDENT PLACEMENT

Implementing an effective placement system is integral to developing a successful vocational training program. **S.B.E. Rule 229.551 (3)(g)** requires 70 percent placement of students who have completed a vocational training program. Although placement is not always a problem, as with students already working in a related occupation, the placement program should place emphasis upon students who are seeking entry-level employment since these students have little or no experience with industry.

The task of the placement program is to locate job openings in the community. The placement coordinator or teacher must know each student's personal aims and interests in addition to the information stated on the achievement record. In many cases, teachers are the best source to match students to job openings because of their contacts with the industry advisory committee. Input concerning employment openings must come from individual business establishments in the community. The placement coordinator should introduce a student to as many suitable job openings as possible. Conversely, employers can then be expected to interview as many qualified candidates as possible.

Cooperative Education

COOPERATIVE EDUCATION APPLICABILITY

Normally, students will complete the entire program as full-time students before obtaining employment. However, there may be situations where students could be allowed to complete part of the program while employed in their occupational areas. At this time it is appropriate for the student to enroll in industrial cooperative education (ICE). Guidelines for this training plan are provided in the "Industrial Cooperative Education Program Guide," published by the Division of Vocational, Adult, and Community Education, Order # IE 508 BK 87.

Industrial cooperative education is a method of instruction designed to prepare students for jobs in the community. This method is a joint effort between the school and the business community. Student trainees receive a combination of instruction in the classroom and related on-the-job training through employment. Learning experiences are jointly planned and supervised by the teacher and the employer. Cooperative education is relevant to the needs of the student preparing for a work role, and will help the student to achieve success and personal satisfaction as the transition is made from school to the constantly changing world of work.

Cooperative education is defined in the Federal Register, Volume 39, number 143, Vocational Education, Section 102.96, as a program ". . . to prepare students for employment, through: (a) providing meaningful work experiences combined with formal education enabling students to acquire knowledge, skills, and appropriate attitudes, (b) removing the artificial barriers which separate work and education, (c) involving educators with employers, creating interaction whereby the needs and problems of both are made known, thereby making it possible for occupational curricula to be revised to reflect current needs in various occupations . . . ."

PURPOSE

Cooperative Education is for persons who, through written cooperative arrangements between the school and employers, receive instruction, including required academic courses and related instruction by alternation of study in school with a job in any industrial occupational field. These two experiences must be planned and supervised by the school and employers so that each contributes to the student's education and employability. Work periods and school attendance may be on alternative half days, full days, weeks or other periods of time to fulfill objectives of the cooperative education program.

GOALS AND OBJECTIVES

The primary goal of the cooperative method of vocational education is to prepare skilled, responsible individuals who can assume a productive role in the community. Specific objectives to meet the primary goal are:

- To prepare individuals for employment, adjustment and advancement in specified occupations or occupational areas (primary objective)
- To provide an understanding of the contribution of work to the social and economic welfare of our nation
- To provide students with an understanding and appreciation of the American free enterprise system
- To foster an awareness of the civic, social and moral responsibilities of individuals to society

- To stimulate students' interest in their chosen occupational fields and provide an understanding of the opportunities in each field
- To provide training that results in increased efficiency in performing job tasks
- To provide curriculum which is sensitive and adaptable to changes in occupational practices and procedures as they are affected by societal, economic, technical and educational developments
- To strive to develop a greater appreciation of the value of specifically trained personnel among employers, employees and consumers
- To reinforce skills learned in the school laboratory
- To provide experiences on tools and equipment not available in the school laboratory
- To supplement and broaden the school curriculum into areas not otherwise available

Student Organization Participation

Vocational student organizations operate pursuant to federal and state laws, which authorize them as viable components of vocational education programs. According to federal regulations, the vocational education program of instruction may include activities of vocational student organizations which are an integral part of the vocational instruction offered and which are supervised by vocational education personnel. The **S.B.E.** Rules authorize vocational student organizations as an integral part of the vocational education program as stated in **S.B.E. 6A-6.064 (7)** and **6A-6.065 (8).**

VOCATIONAL INDUSTRIAL CLUBS OF AMERICA (VICA)

VICA is an organization for secondary or postsecondary students enrolled in trade and industrial education programs in high schools, area vocational technical centers and junior and community colleges. It is the only national and international organization for trade and industrial students. The organization is designed to expand and enrich opportunities for leadership, social awareness and civic responsibility in vocational students.

Students who participate in VICA activities are often better prepared for the world of work. They acquire knowledge of the many opportunities available in their chosen careers and become aware of the value of their

contributions to society. They are also given opportunities to develop and utilize their talents and abilities in ways that otherwise would not be available to them.

BENEFITS OF VICA MEMBERSHIP FOR THE STUDENT

Membership in VICA offers the student the opportunity for growth and development in the following areas:

School and Community Service Activities Students in VICA become involved in various school and/or community services. These may include clothing or food collections for the needy, donation of time and service to the elderly and participation in fund raisers or similar activities.

Social Interaction with Fellow Students Activities are also available that offer students time for relaxation and fun. Social activities of this type may be held on a regular basis. They might be held on the school campus during school hours, or off campus after school. More formal functions would include end of the year award banquets or industry/employer appreciation dinner banquets.

Competition in Skill and Leadership Contests VICA offers various contests in all the skill and leadership areas it serves. Often, teachers identify talented students who represent their school in regional competitions. However, any student member of VICA may compete. Instructors should conduct planned contests within their trade areas. This also pertains to leadership areas. First and second place regional winners then move on to the state level contest. The state winners then compete at the national level of the United States Skill Olympics.

INSTRUCTIONAL RESOURCES

STUDENT REFERENCE MATERIALS

Necessary instructional texts or pertinent material should be available for each student to satisfy training objectives. When textbooks are used, the copyright date should be as current as possible.

SERVICE MANUALS

Manuals with current manufacturer's service procedures and specifications should be available. These manuals must be located where students can use them while working in the shop area.

PERIODICALS

Current general and technical magazines and newspapers should be available for student and instructor use.

The following list of suggested resources is organized under each outcome shown in the curriculum framework. These resources have been recommended by instructors and program administrators through statewide surveys.

01.0 DEMONSTRATE BASIC MAINTENANCE FUNDAMENTALS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Home Repair and Maintenance Jack M. Landers	GOODHEART-WILLCOX COMPANY, INC.	text
Reader's Digest Complete Home Repair Manual	READER'S DIGEST ASSOCIATION	text

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Blueprint Reading Skills - Introduction and Overview	PRENTICE-HALL MEDIA	film
Basic Construction Blueprint Reading Mark W. Huth	DELMAR PUBLISHING	text
Blueprint Reading For Construction (Residential and Commercial) Walter C. Brown	GOODHEART-WILLCOX COMPANY, INC.	text

03.0 DEMONSTRATE PROFICIENCY USING BASIC HAND TOOLS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Carpentry Gaspar J. Lewis	DELMAR PUBLISHING	text
Fundamentals of Carpentry: Tools, Materials, Practices Walter E. Durbahn	AMERICAN TECHNICAL PUBLICATIONS, INC.	text
Stanley Tool Guide	DIVISION OF THE STANLEY WORKS, EDUCATIONAL DEPARTMENT	text

04.0 DEMONSTRATE PROFICIENCY USING POWER TOOLS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Portable Power Tools McDonnell	DELMAR PUBLISHING	text

05.0 REPAIR INTERIOR FLOORS, WALLS AND CEILINGS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Complete Book of Woodworking Rosario Capotosto	POPULAR SCIENCE, HARPER & ROW	text
Modern Carpentry Willis H. Wagner	GOODHEART-WILLCOX COMPANY, INC.	text
Residential Carpentry Mortimer P. Reed	JOHN WILEY & SONS, INC.	text
Installing and Repairing Drywall	LEARNING ARTS	video

06.0 PERFORM REPAIRS ON DOORS, WINDOWS AND SCREENS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Replacing Window Glass	PRENTICE-HALL MEDIA	film
Window Repair	PRENTICE-HALL MEDIA	film
Industrial Arts Woodworking John L. Feirer	CHARLES A. BENNETT COMPANY, INC.	text
Wood: Materials and Processes John L. Feirer	CHARLES A. BENNETT COMPANY, INC.	text

07.0 REPAIR AND REPLACE CABINETS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Cabinet Making and Millwork John L. Feirer	CHARLES A. BENNETT COMPANY, INC.	text
Carpentry and Building Construction John L. Feirer and Gilbert R. Hutchings	CHARLES A. BENNETT COMPANY, INC.	text

08.0 APPLY FINISHES TO PROPERLY PREPARED SURFACES

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Home and Building Maintenance J. C. Woodin and Louis Hayes	McKNIGHT & McKNIGHT PUBLISHING COMPANY	text
Painting and Decorating Encylopedia William Brushwell	GOODHEART-WILLCOX COMPANY, INC.	text
Exterior Prep/Painting	LEARNING ARTS	video

09.0 IDENTIFY WOOD CONSTRUCTION COMPONENTS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Introduction to Construction Mark Huth	DELMAR PUBLISHING	text
Plywood Encyclopedia	AMERICAN PLYWOOD ASSOCIATION	text
Woodworking Technology James J. Hammond, Edward T. Donnelly and Walter R. Harrod	McKNIGHT & McKNIGHT PUBLISHING COMPANY	text

10.0 REPAIR ROOFS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Installing Asphalt Roofing Shingles	PRENTICE-HALL MEDIA	film
Installing Wood Shingles	PRENTICE-HALL MEDIA	film

11.0 REPAIR EXTERIOR MASONRY SURFACES

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Basic Masonry Skills - Brick, Block, Mortar	PRENTICE-HALL MEDIA	film
Basic Masonry Skills - Mason's Tools and Measuring Devices	PRENTICE-HALL MEDIA	film
Basic Masonry Skills - Using the Mason's Trowel	PRENTICE-HALL MEDIA	film
Building Concrete Forms	PRENTICE-HALL MEDIA	film
Pointing Up Brick and Concrete Block	PRENTICE-HALL MEDIA	film
Replacing Ceramic Tile	PRENTICE-HALL MEDIA	film
Cement Mason's Manual for Residential Construction Portland Cement Association	PORTLAND CEMENT ASSOCIATION	text
Complete Do-It-Yourself Manual Reader's Digest Association	READER'S DIGEST ASSOCIATION	text
Masonry and Concrete Max Alth	BENNETT PUBLISHING COMPANY	text

12.0 PERFORM PLUMBING SYSTEM REPAIRS AND MAINTENANCE

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Modern Plumbing E. Keith Blakenbaker	GOODHEART-WILLCOX COMPANY, INC.	
Cutting and Bending Copper Tubing	PRENTICE-HALL MEDIA	film
Cutting and Soldering Copper Pipe	PRENTICE-HALL MEDIA	film
Cutting and Threading Pipe	PRENTICE-HALL MEDIA	film
Household Plumbing Systems	PRENTICE-HALL MEDIA	film
Repairing a Leaky Faucet	PRENTICE-HALL MEDIA	film
Repairing a Leaky Toilet	PRENTICE-HALL MEDIA	film
Residential Plumbing	D. C. A., INC.	film
Basic Plumbing Harry Slater and Lee Smith	DELMAR PUBLISHING	text
Basic Plumbing Illustrated	SUNSET PUBLICATIONS	text
National Standard Plumbing Code	NATIONAL ASSOCIATION OF PLUMBING-HEATING-COOLING CONTRACTORS	text
Southern Standard Plumbing Code	SOUTHERN BUILDING CODE CONGRESS	text

13.0 PERFORM ELECTRICAL SYSTEM FAULT DIAGNOSIS AND REPAIR

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Electrical House Wiring Explained	BERGWALL PRODUCTIONS	film

Building Maintenance Repair L. A. Grimes, Jr.	UNIVERSITY OF TEXAS	text
Electrical Wiring Residential Roy C. Mullin	DELMAR PUBLISHING	text
Electrical Wiring: Residential William J. Whitney	JOHN WILEY & SONS, INC.	text
House-Wiring Simplified Floyd M. Mix	GOODHEART-WILLCOX COMPANY, INC.	text
Modern Refrigeration and Air Conditioning Andrew D. Althouse, Carl H. Turnquist and Alfred F. Brac	GOODHEART-WILLCOX COMPANY, INC.	text
Modern Residential Wiring Harvey Holzman	GOODHEART-WILLCOX COMPANY, INC.	text
National Electrical Code	NATIONAL FIRE PROTECTION ASSOCIATION	text
Principles of Air Conditioning V. Paul Lang	DELMAR PUBLISHING	text
Residential Wiring Gary Rock	AMERICAN TECHNICAL PUBLICATIONS, INC.	text

14.0 DEMONSTRATE EMPLOYABILITY SKILLS

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE
Applying for a Job - Instructor's Guide (CE 004 BK 81)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text
Choosing an Occupation - Instructor's Guide (CE 010 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text

Employability Skills Leader's Guide: In-service Workshop (CE 205 BK 85)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text
Good Work - Instructor's Guide (CE 018 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text
Job Changes - Instructor's Guide (CE 025 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text
Personal Finances - Instructor's Guide (CE 030 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text
Your Job Search - Instructor's Guide (CE 038 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	instructor text
Employability Skills Series (ESS) (CE 001 SS 81)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	module
Applying for a Job - Student Guide (CE 003 BK 79)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text
Choosing an Occupation - Student Guide (CE 009 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text
Employability Skills Participant's Guide: In-service Workshop (CE 074 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text
Good Work - Student Guide (CE 017 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text

Job Changes - Student Guide (CE 024 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text
Personal Finances - Student Guide (CE 029 BK 83)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text
Your Job Search - Student Guide (CE 037 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	student text
A Guide to Employability Skills Materials (CE 042 BK 85)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text
ESS for Success (CE 150 BK 84)	FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION	text

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP

TITLE, AUTHOR, ORDER#	PUBLISHER	TYPE

NONE

PUBLISHERS' ADDRESSES

AMERICAN PLYWOOD ASSOCIATION
Post Office Box 11700
Tacoma, WA 98411

AMERICAN TECHNICAL PUBLICATIONS, INC.
1155 West 175th Street
Homewood, IL 60430
800-323-3471

BENNETT PUBLISHING COMPANY
866 Third Avenue
New York, NY 10022
309-691-4454

BERGWALL PRODUCTIONS
Post Office Box 238
Garden City, NY 11530
800-645-3565

CHARLES A. BENNETT COMPANY, INC.
809 West Detweiller Drive
Peoria, IL 61615-2124
309-691-4454

D. C. A., INC.
424 Valley Road
Warrington, PA 18976-2522
215-343-2020

DELMAR PUBLISHING
2 Computer Drive West
Albany, NY 12212
518-459-1150

DIVISION OF THE STANLEY WORKS, EDUCATIONAL DEPARTMENT
1000 Stanley Drive, Box 7000
New Britain, CT 06050
203-225-5111

FLORIDA DEPARTMENT OF EDUCATION, DIVISION OF VOCATIONAL EDUCATION
Knott Building
Tallahassee, FL 32399

GOODHEART-WILLCOX COMPANY, INC.
123 West Taft Drive
South Holland, IL 60473
800-323-0440

JOHN WILEY & SONS, INC.
605 Third Avenue
New York, NY 10158
212-850-6418

LEARNING ARTS
Post Office Box 179
Wichita, KS 67201
316-682-6594

McKNIGHT & McKNIGHT PUBLISHING COMPANY
809 West Detweiller
Peoria, IL 61615
800-477-0682

NATIONAL ASSOCIATION OF PLUMBING-HEATING-COOLING CONTRACTORS
180 South Washington Street
Box 6808
Falls Church, VA 22046
703-237-8100

NATIONAL FIRE PROTECTION ASSOCIATION
Batterymarch Park
Quincy, MA 02269
800-344-3555

POPULAR SCIENCE, HARPER & ROW
380 Madison Avenue
New York, NY 10017-2513
212-687-3000

PORTLAND CEMENT ASSOCIATION
5420 Old Orchard Road
Skokie, IL 60077-4321
312-966-6200

PRENTICE-HALL MEDIA
90 South Bedford Road
Mt. Kisco, NY 10549
914-631-8300

READER'S DIGEST ASSOCIATION
Reader's Digest Road
Pleasantville, NY 10570
800-638-6460

SOUTHERN BUILDING CODE CONGRESS
900 Montclair Road
Birmingham, AL 35213

SUNSET PUBLICATIONS
2650 West Union Hills Drive, Number 372
Phoenix, AZ 85027

UNIVERSITY OF TEXAS
Post Office Box 7819
Austin, TX 78713-7819
800-252-3206

FACILITIES

Facility Design Recommendations

Facilities, tools and equipment are essential parts of training programs, and must be designed to meet State program standard requirements and instructional objectives. This section of the Program Guide contains information for setting up classroom and laboratory facilities. Facility design criteria and space requirements are specified in **S.B.E. Section B, Chapter 6A-2.**

TEACHING FACILITIES

The instructional environment should duplicate, as closely as possible, the real-life work environment the student will enter after graduation. The more the school resembles the industrial environment, the easier it will be for the student to make the transition from school to work. Tools, supplies and equipment should conform to local industry standards. The teacher should actively pursue supplemental resources to expose the students to state-of-the-art equipment.

All facilities should include classroom space, as well as space for regular classroom equipment such as audio-visual equipment. Laboratory facilities should be equipped with work stations or workbenches, tables, chairs and special training aids to demonstrate basic principles and theory. They should contain enough tools and equipment to enable several students to work individually on the same learning activity.

UPDATING FACILITIES

To keep pace with technological changes and improvements, facilities must be updated on a continuing basis. When planning facilities, priority must be to provide space which will fulfill changing needs of the instructional program. Buildings should be designed with flexibility to expand in order to accomodate future program changes and to allow for greater ease of facility updating. The program advisory committee should be used to assist the school in establishing priorities for obtaining facilities, tools and equipment. Careful planning and analysis of current and future needs will lead to the establishment of an effective training environment.

SCHOOL FACILITIES

Building Maintenance Classroom/Laboratory Areas

This section of the program guide provides guidelines for Building Maintenance program facilities. All vocational programs must meet additional facility requirements specified in **S.B.E. Section B, Chapter 6 A-2.**

The classroom/laboratory areas should be designed to accommodate oversized machinery, equipment, materials and holding tables. Each area should be equipped with special lighting, as necessary. The area should provide oversized openings equipped with service entry doors to the movement and transporting of oversized equipment, materials and products.

The laboratory should include electrical outlets providing 110 volts at each work station. Electrical outlets should be permanently mounted to the work station benches. Additional electrical outlets should be installed along the walls and in the center areas of the laboratory. Electrical outlets in the center areas should be mounted on posts between the ceiling and work stations or on pull down extension systems. Special electrical wiring may be required to supply the power requirements of specialized equipment. All electrical service must be installed according to local building code requirements.

CLASSROOM/LABORATORY FACILITIES

Space requirements for **new** facility construction for this program are specified in **S.B.E. Rule 6A-2.032** as shown below.

NEW FACILITIES BUILDING MAINTENANCE	
Occupant Design Stations	20
Net Square Feet Per Occupant	
Minimum	81
Normal	85
Maximum	89
Total Net Square Feet	
Minimum	1620
Normal	1700
Maximum	1780

WORK STATION ARRANGEMENT

The arrangement of work stations and specialized equipment depends upon the general layout of the facilities, but careful consideration must be given to convenience to entrances and exits, easy movement among work stations and tool/storage areas. The area should have a counter convenient to work stations. Overall layout of the facility should be planned so that the location of entrances and exits permits a logical flow of work in progress. One of the most critical factors in planning a facility is the arrangement of work stations to obtain a safe, efficient traffic pattern.

ADDITIONAL FACILITY CONSIDERATIONS

Training Stations

Training stations and live work areas must be available in the type and number required to meet program goals and performance objectives.

Instructional Area

A classroom or designated area of the laboratory should be available for lecture, instruction, viewing audio visual materials and other nonshop activities.

Personal Tool/Equipment Storage Area

A secure storage room or area should be provided, with enough shelf space for student supplies/tool boxes and floor space for equipment.

General Storage

Storage areas for tools, parts, supplies and machines must be sufficient to support the activities outlined in the program goals and performance objectives.

Office Space

An area separate from the classroom and laboratory should be available and convenient for use by the instructor(s) as an office.

Maintenance

A regular facilities maintenance program must be implemented to ensure that equipment and facilities are safe and usable to meet instructional needs.

Housekeeping

The classroom, laboratory and support area(s) must be kept clean and orderly.

Ventilation

A fume/dust removal system should be in place and operable. When appropriate, heating and cooling systems should be used to provide sufficient comfort for learning. Ventilation requirements are stated in **S.B.E. Rule 6A-2.066.**

First Aid

A first aid station must be in place, well marked and complete with appropriate supplies.

Support Facilities

Restrooms, clean-up areas and lockers convenient to the shop should be available for students.

Safety

The facilities must meet all Occupational Safety and Health Administration (OSHA) safety standards, where applicable.

Facility Evaluation

The program advisory committee should be asked to conduct an annual evaluation of the facilities to insure the program's continuing capability to meet instructional objectives.

Safety, Maintenance and Liability

SAFETY

S.B.E. Rule 6A-2.097

The Florida State Board of Education establishes rules for the operation of public schools. **Part III, Section B, Chapter 6A-2** of the State Board of Education Rules contains the standards for existing educational facilities. Subsections deal with the entire school facility in regard to such topics as electrical equipment, flammable materials, ventilation, fire safety, storage and illumination. Subsection 6A-2.097 contains safety regulations pertaining to vocational classes.

The statute requires 100 percent protection of every student and teacher participating in laboratory work wherein the type of activities listed in the statute above are conducted. This will include: demonstration by teachers or students, students and teachers present in a room or laboratory when students are engaged in make-up work or project work, and when anyone is using tools for construction or repair work involving the shaping or cutting of any solid materials.

Rules and regulations for an eye protection program should be organized and distributed to teachers, students and school personnel. Safety devices should be worn by those participating in the activity and by those who are observers or who may be in close proximity.

Marking of Hazardous Areas

Floors, walls, posts, stationary objects, machinery and equipment should be properly painted, marked, coded or identified, according to recommended safety practices of OSHA, the school board and industry.

Emergency Procedure For Injuries

The following procedures are recommended in the event of an injury or sudden illness in a student:

- Refer to the red "fire or medical emergency" signs posted in appropriate areas.
- Provide immediate first aid if so qualified.
- Notify appropriate personnel to advise them of the problem. They can also contact emergency trained personnel on campus.
- A conscious person has the right to refuse treatment and/or transportation to a medical facility.
- Advise students that they will be financially responsible for ambulance and emergency care.
- The paramedics will assume patient care upon arrival.
- If emergency transportation is not indicated, the student may spend time at the clinic, be allowed to go home or go to a medical facility.
- Be sure to complete the appropriate student injury form for any and all accidents or sudden illness.

MAINTENANCE

Schools should have the necessary facilities for routine maintenance. Special maintenance requirements for this program concern the hand and power tools and machines. Arrangements must be made to accomplish routine and non-routine maintenance of hand and power tools and cutting and shaping machines. Arrangements can be made through the school's shop or an outside agency.

VOCATIONAL TEACHER LIABILITY

Liability of Teacher and School Board

Negligence of vocational education teachers can cause unnecessary injury, and may result in teacher and school district liability. Vocational teachers are recommended to carry personal liability insurance. To reduce the risk of liability and injuries, the following suggestions are provided.

- Follow accepted policies of the school board.
- Do not allow students to use equipment or tools which have not been approved by the administration and Board of Education.
- Establish safety rules and enforce them.
- Do not leave the shop/laboratory while students are working.
- Do not permit non-enrolled students to use the shop/laboratory.
- Do not allow students to use machines or tools for which instruction has not been given.
- Do not approve unsupervised student activities inside or outside the shop/laboratory.
- Prepare accident forms for all accidents.
- Regularly inspect the workplace and equipment for defects or potential hazards and maintain documentation of unserviceable or hazardous items.
- Consider age, maturity, skill and ability of students when providing instruction and supervision.
- Adminster safety tests to students upon completion of the demonstration of a specific machine, tool or process and keep documentation on file in your office.
- Require all students to wear eye protection devices, when appropriate, for laboratory activities.

SUGGESTED EQUIPMENT LIST

General Classroom Equipment

DESCRIPTION

Chalkboard

Bulletin board

Bookcases

Cabinet-storage

Student study stations

Audio-visual equipment as needed

Laboratory Tools and Equipment

These tools and items of equipment are normally used in this program. Equipment items are listed under each outcome, corresponding to the curriculum framework. Consumable supplies should be readily available to assure continuous instruction. Consumable supplies such as nails, wood putty and chalk are not contained in the equipment list.

01.0 DEMONSTRATE BASIC MAINTENANCE FUNDAMENTALS

DESCRIPTION

Hardhats
Measuring tapes
Rule, wood, folding
Safety glasses

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS

DESCRIPTION

Architect's scale

03.0 DEMONSTRATE PROFICIENCY USING BASIC HAND TOOLS

DESCRIPTION

Awl, scratch
Bit, auger
Bit, expansive
Bit, hole saw
Bit, lockset
Bit, masonry
Bit, screwdriver
Bit, skip auger
Bits, twist, set
Brace
Brooms, hand
Brooms, push
Brushes, bench
Chisel, cold
Chisel, floor
Chisel, rip
Chisel, stripping
Chisel, wood
Clamp, 'C'
Clamp, bench, bar
Clamp, bench, pipe
Clamp, bench, twin rod
Clamp, hand, screw
Clamp, spring
Countersink
Cutter, bolt
Cutter, side
Drill points, set
Drill, hand
Drill, push
File, cant
File, flat
File, half-round
File, round
File, square

File, three-cornered
Gage, butt
Gage, marking
Gun, caulking
Hammer, ball-peen
Hammer, curved claw
Hammer, half-hatchet
Hammer, holster
Hammer, rip claw
Hammer, rubber mallet
Hammer, sledge
Hammer, soft-faced
Hammer, straight claw
Knife, putty
Knife, utility
Ladder, extension
Ladder, step
Level, builder's
Level, carpenter's
Level, sliding T-bevel
Level, spirit
Level, torpedo
Level, water
Nail claw
Nail set
Oilstone (whetstone)
Plane, block
Plane, jack
Pliers, channellock
Pliers, diagonal
Pliers, needle nose
Pliers, slip joint
Plumb bob
Pry (crowbar)
Punch, magnetic
Punch, pin
Punch, straight
Rasp, wood
Rule, bench
Rule, straight
Saw, coping
Saw, crosscut
Saw, dovetail
Saw, hacksaw
Saw, keyhole
Saw, rip
Scoop, sand
Scraper
Screwdriver, flatblade
Screwdriver, off-set
Screwdriver, phillips

Screwdriver, spiral ratchet
Scriber(s)
Shovel, round point
Shovel, square point
Snips, tin
Square, combination
Square, framing
Square, try
Straightedge
Tool box
Vise grips
Vise, utility
Vise, wood
Wheelbarrow
Wrench, adjustable
Wrench, box end
Wrench, combination
Wrench, hex head (allen)
Wrench, open-end
Wrench, socket set 1/4, 3/8, 1/2 inch drives with ratchet handles

04.0 DEMONSTRATE PROFICIENCY USING POWER TOOLS

DESCRIPTION

Air compressor
Drill, electric
Drill, press
Grinder, bench
Gun, glue
Gun, nailing
Gun, stapling, air
Hammer, rotary, electric
Jointer
Plane, cabinetmaker's
Plane, electric
Plane, rabbet
Router
Sander, belt
Sander, disc
Sander, orbital
Sander, vibrator
Saw, band
Saw, circular
Saw, electric miter
Saw, radial arm
Saw, reciprocating

Saw, saber
Saw, table
Screwdriver, automatic
Shaper, spindle

05.0 REPAIR INTERIOR FLOORS, WALLS AND CEILINGS

DESCRIPTION

Bar, ripping
Carpet vacuum cleaner, water type
Chalk line
Cutter, circle, wallboard
Dividers, wing
Hammer, drywall
Level, line
Tile cutters
Transit

06.0 PERFORM REPAIRS ON DOORS, WINDOWS AND SCREENS

DESCRIPTION

Box, miter
Cutter, glass
Knife, linoleum
Spatula, wood putty

07.0 REPAIR AND REPLACE CABINETS

DESCRIPTION

J-roller
Laminate trimmer
Micro-splitter

08.0 APPLY FINISHES TO PROPERLY PREPARED SURFACES

DESCRIPTION

Brushes, paint
Brushes, touch-up
Brushes, varnish
Buffer, electric
Buffer, hand
Rollers, paint
Sponges, staining

09.0 IDENTIFY WOOD CONSTRUCTION COMPONENTS

DESCRIPTION

NONE

10.0 REPAIR ROOFS

DESCRIPTION

Brushes, tar
Rollers, tar

11.0 REPAIR EXTERIOR MASONRY SURFACES

DESCRIPTION

Block & tackle
Boards, mortar
Box, mortar
Brick sets
Brushes, acid
Brushes, bricklayer
Brushes, wire, combination brush & scraper
Buckets
Chisels, brick

Chisels, masonry, set
Drill, star
Edgers, cement
Floats, rubber
Groovers, center, cement
Hoes, mortar
Hose, water, 5/8 in. x 50 ft.
Jointer, block
Jointer, bricklayer's
Jointer, rake, bricklayer's
Jointer, round, bricklayer's
Jointer, sled runner, bricklayer's
Jointer, weather, bricklayer's
Markers, tile
Mixer, mortar
Pick
Rule, brickspacing
Rule, modular, mason's
Saw, masonry, 14 in. blade
Tampers, hand
Tongs, bucking
Tool set, block & bricklaying
Tool set, finish, concrete
Trowels, brick
Trowels, cement finishing
Trowels, plastering
Trowels, pointed
Wheelbarrow, cement

12.0 PERFORM PLUMBING SYSTEM REPAIRS AND MAINTENANCE

DESCRIPTION

Bender, tubing, spring type
Cutter, (reamer) tub
Dies, pipe-threading
Plunger, vacuum
Pumps, test
Snake, drain cleaner
Snake, plumbing
Taps, pipe
Tool, rodding, power
Torch, hot air
Torch, propane
Turnbuckles & clamps
Vise, pipe
Work sample, bath tub
Work sample, dishwasher

Work sample, garbage disposal
Work sample, hot water heating system with boiler, controls, & radiators
Work sample, icemaker/refrigerator
Work sample, kitchen sink
Work sample, lavatory
Work sample, shower
Work sample, washing machine
Work sample, water closet
Work sample, water heater

13.0 PERFORM ELECTRICAL SYSTEM FAULT DIAGNOSIS AND REPAIR

DESCRIPTION

Demo board, automatic circuit breaker
Demo board, emergency lighting
Demonstrator, ground fault protection
Extension cords
Gage, wire
Load unit, resistance/reactance
Meter, inductance
Multimeter
Parts kits, AC circuit, basic
Parts kits, DC circuit
Tester, capacitor, wide voltage range
Trainer board, residential electrical
Trainer, basic electric
Trainer, electric wiring skill
Wattmeter, AC

14.0 DEMONSTRATE EMPLOYABILITY SKILLS

DESCRIPTION

NONE

15.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP

DESCRIPTION

NONE

PROFESSIONAL DEVELOPMENT

Teacher Technical Updating

Technical updating workshops are scheduled periodically throughout the State, usually in the summer months. Teachers should take advantage of the opportunity to attend the building maintenance technical update workshops when they are held. All instructional staff are encouraged to participate in as many training opportunities as possible.

Teachers should seek opportunities with local companies to maintain currency with industry trends. During periods when school is not in session, teachers are encouraged to make arrangements to return to industry for suitable involvement in their area of expertise.

Membership in professional associations offers vocational educators an enormous range of opportunities for working together to strengthen the field and to develop personal competence and satisfaction in work. The associations have similar goals and activities. They seek excellence in program content by means of joint efforts among members, communications that keep members current, forums for the discussion of issues in the field, useful and stimulating publications and sound professional growth experiences at local, state, regional and national meetings and annual conventions. They are concerned with increasing public understanding and support of the field. Teachers are encouraged to maintain affiliation with professional organizations. A list of professional organizations follows this section of the guide.

Teacher Standards

As a prerequisite to certification, teachers must have the required years of experience in the appropriate technical field as defined in the certification standards. For the Building Maintenance program, the requirements are six years continuous experience in building maintenance. The teacher is then judged qualified to teach upon meeting one of the following criteria: (1) regular or temporary Florida teacher's certificate with appropriate coverage, (2) Approval of local school board consistent with adopted school policy or (3) regular or temporary Florida teacher's certificate with other than appropriate coverage (has met all occupational experience requirements prescribed as a prerequisite to appropriate certification and has been approved by the school board to teach out-of-

field.) Refer to the Curriculum Framework for this program to determine the appropriate occupational specialization coverage required for certification.

Instructional staff must have technical competency and meet all State and local requirements for certification. Instructors should hold current, nationally recognized certification in the subject areas taught, if awarded. Beginning teachers must be enrolled in the State Beginning Teacher Program.

A systematic method of obtaining "substitute" instructors, approved by the school board, should be used to assure instructional continuity. An orientation session for substitutes should be held on a regular basis. The substitute should be a competent instructor in the occupational area and specific competencies taught.

Professional Organizations and Support Services

EDUCATION ORGANIZATIONS

AMERICAN VOCATIONAL ASSOCIATION (AVA)
1410 King Street
Alexandria, VA 22314
800-826-9972

FLORIDA ASSOCIATION FOR TRADE AND INDUSTRIAL EDUCATION, INC. (FATIE)
Florida Department of Education
Industrial Education - Vocational Division
Knott Building
Tallahassee, FL 32399
904-488-0484

FLORIDA VOCATIONAL ASSOCIATION (FVA)
1420 North Paul Russell Road
Tallahassee, FL 32399
904-878-6860

FLORIDA VOCATIONAL INDUSTRIAL CLUBS OF AMERICA (VICA)
Florida Department of Education
Knott Building
Tallahassee, FL 32399
904-488-0484

TRADE ORGANIZATIONS

This list contains trade associations and technical societies. Many offer training programs of some sort, either directly or through their member companies. Specific details should be requested in writing.

ALUMINUM ASSOCIATION
818 Connecticut Avenue Northwest
Washington, DC 20006-2702
202-862-5100

ASSOCIATED GENERAL CONTRACTORS OF AMERICA
1957 East Street Northwest
Washington, DC 20006-5107
202-393-2040

DOOR & HARDWARE INSTITUTE
7711 Old Springhouse Road
McLean, VA 22102-3474
703-556-3990

INDUSTRIAL HEATING EQUIPMENT ASSOCIATION
1901 North Moore Street
Arlington, VA 22209-1706
703-525-2513

MICA INDUSTRY ASSOCIATION
233 Broadway
New York, NY 10279-0001
212-962-4415

NATIONAL ASSOCIATION OF HOME BUILDERS OF THE U. S.
15th & M Streets Northwest
Washington, DC 20005-2802
202-452-0200

NATIONAL ASSOCIATION OF PLUMBING-HEATING-COOLING CONTRACTORS
180 South Washington Street Box 6808
Falls Church, VA 22046-0000
703-237-8100

NATIONAL FOREST PRODUCTS ASSOCIATION
1619 Massachusetts Avenue Northwest
Washington, DC 20036-2213
202-797-5800

NATIONAL RETAIL HARDWARE ASSOCIATION
770 North High School Road
Indianapolis, IN 46224-7619
317-248-1261

PLUMBING MANUFACTURERS INSTITUTE
800 Roosevelt Road Suite 20
Glen Ellyn, IL 60137-5832
312-858-9172

PLUMBING-HEATING-COOLING INFORMATION BUREAU
303 East Wacker Drive
Chicago, IL 60601-5212
312-372-7331

PORTLAND CEMENT ASSOCIATION
5420 Old Orchard Road
Skokie, IL 60077-1030
312-966-6200

WOOD PRODUCTS MANUFACTURERS ASSOCIATION
52 Racette Avenue
Gardner, MA 01440-0000
617-632-3923

INTERNATIONAL UNION OF BRICKLAYERS & ALLIED CRAFTSMEN
815 15th Street Northwest
Washington, DC 20005-2201
202-783-3788

UNITED BROTHERHOOD OF CARPENTERS & JOINERS OF AMERICA
101 Constitution Avenue Northwest
Washington, DC 20001
202-546-6206

UNITED ASSOCIATION OF JOURNEYMEN & APPRENTICES OF THE PLUMBING & PIPE FITTING INDUSTRY OF THE UNITED STATES & CANADA
901 Massachusetts Avenue Northwest
Washington, DC 20001
202-628-5823

UNITED UNION OF ROOFERS, WATERPROOFERS & ALLIED WORKERS
1125 17th Street Northwest
Washington, DC 20036-4707
202-638-3228

FL88CD18

019313
proposal #018858

CAREER MERIT ACHIEVEMENT PLAN (CAREER MAP)

BUILDING MAINTENANCE

(IN48.040100)

State of Florida

An affirmative action/equal opportunity employer

DEPARTMENT OF EDUCATION
Betty Castor, Commissioner of Education

DIVISION OF VOCATIONAL, ADULT AND COMMUNITY EDUCATION
Robert S. Howell, Director

DEVELOPED BY:
University of South Florida
Department of Adult and Vocational Education

INDUSTRY-BASED PARTNERSHIP PROGRAMS: The State of Florida is committed to the development of industry-based partnership programs, designed by education and industry to respond to industry's demand for a highly skilled work force.

ACKNOWLEDGEMENTS

PARTNERSHIP WITH INDUSTRY

The following industry representatives are recognized for their valuable contributions to the identification and validation of the building maintenance competencies reflected in this MAP:

Mr. John Barrios, Building Services Supervisor, City of Tampa
Mr. Michael L. Davis, Contractor, Quality Construction
Mr. Ralph Shelburn, Resident Manager, Ambassador Property

For further information, contact
Bureau of Vocational Program and Staff Development
Division of Vocational, Adult, and Community Education
Department of Education
Knott Building
Tallahassee, FL 32399

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THIS MERIT ACHIEVEMENT PLAN RECORDS THE BUILDING MAINTENANCE ACHIEVEMENTS OF:

Student's Name _____

Student ID Number _____

Student's Address _____

_____

Initial Instructor _____

School _____

Date Started _____

PRIMARY JOB TITLE(S) FOR BUILDING MAINTENANCE

- General Maintenance Repairers (OES#501 44821)

Program completers qualify for the primary job title(s) listed above. Related job titles may be added based on those job titles found in industry and/or the Dictionary of Occupational Titles.

OVERVIEW

This Career MAP includes the competencies required for entry into the field of building maintenance. Business and industry representatives have recommended that students in this field master these competencies in order to become employable. Local education agencies (LEAs) may adapt these competencies to meet their workforce needs.

PURPOSE OF THE MAP

The purposes of the MAP are: to display the student performance standards (SPS) required by the LEA and to document the level of achievement on student performance standards that the student demonstrates.

HOW TO USE THE MAP

Administrator and Instructor. The administrator and instructor can use Career MAPs in curriculum planning, program updating and improvement and teacher recruitment, selection and updating. If the LEA changes or adds student performance standards, the revised or additional student performance standards should be included in the blank boxes that appear within each intended outcome or at the end of this MAP.

Instructor. The instructor can use Career MAPs to keep track of student progress on student performance standards. By periodically reviewing the ratings on student performance standards, the instructor can identify a student's strengths and weaknesses and, on that basis, identify the skills for which the student needs remedial instruction or advanced training. The MAP can also be useful in student counseling and evaluation.

Co-op Instructor/Employer. The employer who sponsors a co-op program should use the Career MAP for keeping a record of the student's performance on appropriate standards. The MAPs will also help the co-op instructor/employer in counseling and evaluating the student.

Student. The student may use the MAP to show potential employers the performance standards he or she has mastered. In order to present a complete record, the student should encourage the instructor/co-op employer to rate his or her level of achievement on all the appropriate student performance standards and to fill in the verification form/cooperative work experience page in the back of this MAP.

Employer. The MAP shows an employer the student performance standards mastered by the student (a prospective employee) and the proficiency level achieved on each student performance standard. This information can help the employer make decisions about hiring, job assignments and job-training needs.

RATING STUDENT PERFORMANCE STANDARDS

Ratings on student performance standards should be based upon business/industrial performance standards. The evaluator observes and evaluates student performance as he or she would in the role of the employer or supervisor.

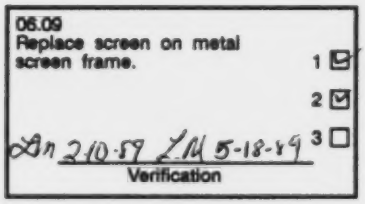
For each skill listed the learner receives a rating of 1, 2 or 3. Each rating indicates a particular level of achievement:

1 = Learner demonstrates knowledge and understanding of this student performance standard, but is not yet able to apply that knowledge or understanding.

2 = Learner performs this student performance standard satisfactorily with only periodic supervision.

3 = Learner performs this student performance standard satisfactorily without supervision.

Whenever a performance standard is demonstrated, the instructor checks the appropriate rating box (1, 2 or 3) and initials and dates the verification line. If the student later demonstrates a higher level of achievement on a performance competency, the instructor crosses out the old level, checks the higher level and then enters his or her initials and the new date on the verification line, as shown in the following example:



NOTE: A student performance standard without a checked rating indicates that the learner has not mastered the standard from lack of either ability, time, opportunity or need (the student's area of specialization may not have required it).

01.0 DEMONSTRATE BASIC MAINTENANCE FUNDAMENTALS.

01.01 Comply with safety rules & practices. 1 ☐ 2 ☐ 3 ☐ Verification	01.02 Make job-related decimal & fraction calculations. 1 ☐ 2 ☐ 3 ☐ Verification	01.03 Solve job-related problems by adding, subtracting, multiplying & dividing numbers. 1 ☐ 2 ☐ 3 ☐ Verification
01.04 Change numbers to percents. 1 ☐ 2 ☐ 3 ☐ Verification	01.05 Solve job-related problems operating a hand-held calculator. 1 ☐ 2 ☐ 3 ☐ Verification	01.06 Use ruler & tape measure to determine measurements. 1 ☐ 2 ☐ 3 ☐ Verification
01.07 Compute feet, inches & yards. 1 ☐ 2 ☐ 3 ☐ Verification	01.08 Change hours & minutes to decimals, fractions & mixed numbers. 1 ☐ 2 ☐ 3 ☐ Verification	01.09 Find inside & outside diameters of a pipe. 1 ☐ 2 ☐ 3 ☐ Verification
01.10 Calculate the time charged for labor of a job. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

02.0 DEMONSTRATE ABILITY TO READ PLANS AND DRAWINGS.

02.01 Identify dimensions. 1 ☐ 2 ☐ 3 ☐ Verification	02.02 Identify construction views, floor plans & elevations. 1 ☐ 2 ☐ 3 ☐ Verification	02.03 Identify interior details. 1 ☐ 2 ☐ 3 ☐ Verification

02.04 Identify wiring details. 1 ☐ 2 ☐ 3 ☐ Verification	02.05 Identify use of the architect's scale. 1 ☐ 2 ☐ 3 ☐ Verification	02.06 Identify electrical wiring symbols. 1 ☐ 2 ☐ 3 ☐ Verification
02.07 Identify lists of materials & specifications. 1 ☐ 2 ☐ 3 ☐ Verification	02.08 Identify section views. 1 ☐ 2 ☐ 3 ☐ Verification	02.09 Identify plumbing symbols used in blueprints. 1 ☐ 2 ☐ 3 ☐ Verification
02.10 Identify fitting symbols used in blueprints. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

03.0 DEMONSTRATE PROFICIENCY USING BASIC HAND TOOLS.

03.01 Use claw hammer to drive & pull out nails. 1 ☐ 2 ☐ 3 ☐ Verification	03.02 Use hand saws to cut boards. 1 ☐ 2 ☐ 3 ☐ Verification	03.03 Use screwdrivers to drive in screws. 1 ☐ 2 ☐ 3 ☐ Verification
03.04 Drill holes with hand powered drills. 1 ☐ 2 ☐ 3 ☐ Verification	03.05 Identify types & describe use of wrenches. 1 ☐ 2 ☐ 3 ☐ Verification	03.06 Identify types & describe use of pipe wrenches & plumbing tools. 1 ☐ 2 ☐ 3 ☐ Verification
03.07 Identify types & describe proper use of chisels. 1 ☐ 2 ☐ 3 ☐ Verification	03.08 Identify types & describe proper use of a staple gun. 1 ☐ 2 ☐ 3 ☐ Verification	03.09 Identify types & describe proper use of a wood plane. 1 ☐ 2 ☐ 3 ☐ Verification

03.10 Identify types & describe proper use of woodworking files. 1 ☐ 2 ☐ 3 ☐ Verification	03.11 Identify types & describe proper use of the spirit level. 1 ☐ 2 ☐ 3 ☐ Verification	03.12 Identify types & describe proper use of a socket wrench set. 1 ☐ 2 ☐ 3 ☐ Verification
03.13 Identify types & describe proper use of a hand or block sander. 1 ☐ 2 ☐ 3 ☐ Verification	03.14 Identify types & describe uses of carpenters' squares & levels. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

04.0 DEMONSTRATE PROFICIENCY USING POWER TOOLS.

04.01 Setup, use & maintain portable power orbital sander, belt sander & finish sander. 1 ☐ 2 ☐ 3 ☐ Verification	04.02 Setup, use & maintain portable drill & power screwdriver. 1 ☐ 2 ☐ 3 ☐ Verification	04.03 Setup, use & maintain hand-held circular saw & reciprocating saw. 1 ☐ 2 ☐ 3 ☐ Verification
04.04 Setup, use & maintain a radial arm saw. 1 ☐ 2 ☐ 3 ☐ Verification	04.05 Setup, use & maintain a table saw. 1 ☐ 2 ☐ 3 ☐ Verification	04.06 Setup, use & maintain a drill press. 1 ☐ 2 ☐ 3 ☐ Verification
04.07 Setup, use & maintain a band saw. 1 ☐ 2 ☐ 3 ☐ Verification	04.08 Setup, use & maintain a power plane. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

05.0 REPAIR INTERIOR FLOORS, WALLS AND CEILINGS.

05.01 Repair a hole in dry wall. 1 ☐ 2 ☐ 3 ☐ Verification	05.02 Install paneling. 1 ☐ 2 ☐ 3 ☐ Verification	05.03 Install dry wall. 1 ☐ 2 ☐ 3 ☐ Verification
05.04 Check & repair fabric wall covering. 1 ☐ 2 ☐ 3 ☐ Verification	05.05 Replace broken floor tile. 1 ☐ 2 ☐ 3 ☐ Verification	05.06 Install interior trim. 1 ☐ 2 ☐ 3 ☐ Verification
05.07 Measure size of room. 1 ☐ 2 ☐ 3 ☐ Verification	05.08 Replace ceramic tile. 1 ☐ 2 ☐ 3 ☐ Verification	05.09 Describe the processes to shampoo carpets. 1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

06.0 PERFORM REPAIRS ON DOORS, WINDOWS AND SCREENS.

06.01 Install a prehung door & casing. 1 ☐ 2 ☐ 3 ☐ Verification	06.02 Install door hardware. 1 ☐ 2 ☐ 3 ☐ Verification	06.03 Replace doors. 1 ☐ 2 ☐ 3 ☐ Verification
06.04 Check & replace hinges on doors. 1 ☐ 2 ☐ 3 ☐ Verification	06.05 Check & replace door closers. 1 ☐ 2 ☐ 3 ☐ Verification	06.06 Remove, measure & replace glass in wood frame window. 1 ☐ 2 ☐ 3 ☐ Verification

06.07 Remove, measure & replace glass in metal frame window. 1 ☐ 2 ☐ 3 ☐ Verification	06.08 Replace screen on wood screen frame. 1 ☐ 2 ☐ 3 ☐ Verification	06.09 Replace screen on metal screen frame. 1 ☐ 2 ☐ 3 ☐ Verification
06.10 Check & repair window glaze seal. 1 ☐ 2 ☐ 3 ☐ Verification	06.11 Replace sash locks in wooden windows. 1 ☐ 2 ☐ 3 ☐ Verification	06.12 Inspect & replace metal window operators & locks. 1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

07.0 REPAIR AND REPLACE CABINETS.

07.01 Identify parts of a cabinet. 1 ☐ 2 ☐ 3 ☐ Verification	07.02 Identify types of cabinet door installation. 1 ☐ 2 ☐ 3 ☐ Verification	07.03 Identify types of cabinet hardware. 1 ☐ 2 ☐ 3 ☐ Verification
07.04 Install cabinet hardware. 1 ☐ 2 ☐ 3 ☐ Verification	07.05 Describe cabinet installation procedures. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

08.0 APPLY FINISHES TO PROPERLY PREPARED SURFACES.

08.01 Erect an extension ladder for working at a height of twelve feet. 1 ☐ 2 ☐ 3 ☐ Verification	08.02 Erect a scaffold to work at a height of twelve feet. 1 ☐ 2 ☐ 3 ☐ Verification	08.03 Paint a surface with a roller, brush & sprayer. 1 ☐ 2 ☐ 3 ☐ Verification
08.04 Prepare, seal & stain new wood. 1 ☐ 2 ☐ 3 ☐ Verification	08.05 Apply coat of clear finish to stained wood. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

09.0 IDENTIFY WOOD CONSTRUCTION COMPONENTS.

09.01 Identify components of interior walls. 1 ☐ 2 ☐ 3 ☐ Verification	09.02 Identify components of exterior walls. 1 ☐ 2 ☐ 3 ☐ Verification	09.03 Identify components of roofs. 1 ☐ 2 ☐ 3 ☐ Verification
09.04 Identify components of flooring systems. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

10.0 REPAIR ROOFS.

10.01 Check & repair asphalt shingles. 1 ☐ 2 ☐ 3 ☐ Verification	10.02 Check & repair roof gutters & downspouts. 1 ☐ 2 ☐ 3 ☐ Verification	10.03 Seal pipes & vents on roofs. 1 ☐ 2 ☐ 3 ☐ Verification
10.04 Check & repair sheetmetal roofs. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

11.0 REPAIR EXTERIOR MASONRY SURFACES.

11.01 Identify the tools & equipment used for mixing mortar. 1 ☐ 2 ☐ 3 ☐ Verification	11.02 List the factors affecting consistency of mortar. 1 ☐ 2 ☐ 3 ☐ Verification	11.03 List common ratios of mortar mixtures. 1 ☐ 2 ☐ 3 ☐ Verification
11.04 Mix tuck pointing mortar. 1 ☐ 2 ☐ 3 ☐ Verification	11.05 Apply mortar for brickwork. 1 ☐ 2 ☐ 3 ☐ Verification	11.06 Identify methods of putting up the line. 1 ☐ 2 ☐ 3 ☐ Verification
11.07 Identify types of trowels. 1 ☐ 2 ☐ 3 ☐ Verification	11.08 Apply mortar for block work. 1 ☐ 2 ☐ 3 ☐ Verification	11.09 List reasons for cleaning. 1 ☐ 2 ☐ 3 ☐ Verification

11.10 Identify cleaning equipment. 1 ☐ 2 ☐ 3 ☐ Verification	11.11 List types of cleaning material. 1 ☐ 2 ☐ 3 ☐ Verification	11.12 List reasons for caulking. 1 ☐ 2 ☐ 3 ☐ Verification
11.13 Match types of caulking to specific uses. 1 ☐ 2 ☐ 3 ☐ Verification	11.14 Replace caulking in expansion joints. 1 ☐ 2 ☐ 3 ☐ Verification	11.15 List safety precautions to follow when cleaning. 1 ☐ 2 ☐ 3 ☐ Verification
11.16 Identify methods of wall cleaning. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

12.0 PERFORM PLUMBING SYSTEM REPAIRS AND MAINTENANCE.

12.01 Replace fixtures & hardware. 1 ☐ 2 ☐ 3 ☐ Verification	12.02 Replace a lavatory. 1 ☐ 2 ☐ 3 ☐ Verification	12.03 Describe procedures to replace bathtubs & showers. 1 ☐ 2 ☐ 3 ☐ Verification
12.04 Replace kitchen sinks. 1 ☐ 2 ☐ 3 ☐ Verification	12.05 Install garbage disposals. 1 ☐ 2 ☐ 3 ☐ Verification	12.06 Repair or replace water closet components. 1 ☐ 2 ☐ 3 ☐ Verification
12.07 Replace traps. 1 ☐ 2 ☐ 3 ☐ Verification	12.08 Repair leaks in faucets. 1 ☐ 2 ☐ 3 ☐ Verification	12.09 Replace hot water heater tanks. 1 ☐ 2 ☐ 3 ☐ Verification

12.10 Replace or repair fixture water supply pipes. 1 ☐ 2 ☐ 3 ☐ Verification	12.11 Reseal toilets to flanges. 1 ☐ 2 ☐ 3 ☐ Verification	12.12 Test & inspect repaired systems. 1 ☐ 2 ☐ 3 ☐ Verification
12.13 Cut metal pipe with a one wheel steel pipe cutter. 1 ☐ 2 ☐ 3 ☐ Verification	12.14 Join plastic pipe to steel pipe. 1 ☐ 2 ☐ 3 ☐ Verification	12.15 Thread steel pipe with a nonadjustable die stock. 1 ☐ 2 ☐ 3 ☐ Verification
12.16 Cut copper tubing or pipe with a hacksaw. 1 ☐ 2 ☐ 3 ☐ Verification	12.17 Cut copper tubing or pipe with a tubing cutter. 1 ☐ 2 ☐ 3 ☐ Verification	12.18 Bend copper tubing or pipe with a spring bender. 1 ☐ 2 ☐ 3 ☐ Verification
12.19 Join copper tubing or pipe to copper tubing or pipe. 1 ☐ 2 ☐ 3 ☐ Verification	12.20 Join copper tubing to brass pipe fittings. 1 ☐ 2 ☐ 3 ☐ Verification	12.21 Join copper tubing to steel pipe. 1 ☐ 2 ☐ 3 ☐ Verification
12.22 Join copper tubing or pipe to plastic pipe. 1 ☐ 2 ☐ 3 ☐ Verification	12.23 Clean a drain & vent system with a manual snake or tape. 1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

13.0 PERFORM ELECTRICAL SYSTEM FAULT DIAGNOSIS AND REPAIR.

13.01 Replace duplex wall outlet. 1 ☐ 2 ☐ 3 ☐ Verification	13.02 Replace single pole light switch. 1 ☐ 2 ☐ 3 ☐ Verification	13.03 Replace a light in a fluorescent system. 1 ☐ 2 ☐ 3 ☐ Verification

BUILDING MAINTENANCE

13.04 Replace a faulty breaker. 1 ☐ 2 ☐ 3 ☐ Verification	13.05 Use a meter to determine continuity in an electrical distributor system. 1 ☐ 2 ☐ 3 ☐ Verification	13.06 Deenergize a circuit for repairs. 1 ☐ 2 ☐ 3 ☐ Verification
13.07 Trace electrical circuits. 1 ☐ 2 ☐ 3 ☐ Verification	13.08 Replace a ballast in a fluorescent system. 1 ☐ 2 ☐ 3 ☐ Verification	13.09 Check a heating-cooling thermostat. 1 ☐ 2 ☐ 3 ☐ Verification
13.10 Use a voltage tester. 1 ☐ 2 ☐ 3 ☐ Verification	13.11 Read resistance with an ohmmeter. 1 ☐ 2 ☐ 3 ☐ Verification	13.12 Service air filters. 1 ☐ 2 ☐ 3 ☐ Verification
13.13 Identify types of conduit. 1 ☐ 2 ☐ 3 ☐ Verification	13.14 Describe functions of a basic refrigeration system. 1 ☐ 2 ☐ 3 ☐ Verification	13.15 Replace a thermostat for a split system. 1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

0.0 DEMONSTRATE EMPLOYABILITY SKILLS.

0.01 Conduct a job search. 1 ☐ 2 ☐ 3 ☐ Verification	0.02 Secure information about a job. 1 ☐ 2 ☐ 3 ☐ Verification	0.03 Identify documents that may be required when applying for a job. 1 ☐ 2 ☐ 3 ☐ Verification
0.04 Complete a job application form correctly. 1 ☐ 2 ☐ 3 ☐ Verification	0.05 Demonstrate competence in job interview techniques. 1 ☐ 2 ☐ 3 ☐ Verification	0.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other persons. 1 ☐ 2 ☐ 3 ☐ Verification
0.07 Identify acceptable work habits. 1 ☐ 2 ☐ 3 ☐ Verification	0.08 Demonstrate knowledge of how to make job changes appropriately. 1 ☐ 2 ☐ 3 ☐ Verification	0.09 Demonstrate acceptable employee health habits. 1 ☐ 2 ☐ 3 ☐ Verification

00.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP.

00.01 Define entrepreneurship. 1 ☐ 2 ☐ 3 ☐ Verification	00.02 Describe the importance of entrepreneurship to the American economy. 1 ☐ 2 ☐ 3 ☐ Verification	00.03 List the advantages & disadvantages of business ownership. 1 ☐ 2 ☐ 3 ☐ Verification
00.04 Identify the risks involved in ownership of a business. 1 ☐ 2 ☐ 3 ☐ Verification	00.05 Identify the necessary personal characteristics of a successful entrepreneur. 1 ☐ 2 ☐ 3 ☐ Verification	00.06 Identify the business skills needed to operate a small business efficiently & effectively. 1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

P.O.W.E.R. SKILLS (PRINCIPLES OF WORK ENVIRONMENT READINESS)

000.0 COOPERATIVE WORK EXPERIENCE COMPETENCIES.

1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification
1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification	1 ☐ 2 ☐ 3 ☐ Verification

VERIFICATION

The instructor should verify the level of mastery achieved by the student by initialing the competency box each time the student masters a competency. Later, if the student achieves a higher degree of mastery of a competency, the higher degree should be recorded and verified by the instructor.

INSTRUCTOR SHOULD SIGN FULL NAME AND SCHOOL NAME AND ADDRESS IN THE SPACE BELOW.

Verification	Signature
	Title
	School Name
	School Address

Verification	Signature
	Title
	School Name
	School Address

Verification	Signature
	Title
	School Name
	School Address

COOPERATIVE WORK EXPERIENCE

In addition to classroom training and laboratory performance identified on the Career MAP, this student has participated in cooperative work experience with employers as shown below:

Dates _____

Employer _____

Address of Employer _____

Supervisor _____

Supervisor Title _____

Dates _____

Employer _____

Address of Employer _____

Supervisor _____

Supervisor Title _____

Dates _____

Employer _____

Address of Employer _____

Supervisor _____

Supervisor Title _____

NOTES

This section of the MAP is provided so the instructor, employer, or student may list additional qualifying statements or other pertinent information. All comments should be initialed for verification.